

## THE LIFE HISTORY OF *FITCHIA APTERA* STÅL (HEMIPTERA-HETEROPTERA: REDUVIIDAE)

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*Fitchia aptera* Stål is one of the less well known bugs of the North American Reduviidae. It lives on the ground at the bases of tall grass clumps such as those in abandoned fields and is seldom abundant. Readio (1927), for example, does not give the life history of this species. Adults have been taken occasionally by sweeping tall grass, especially in the early evening, but during the day they remain secluded on the ground. Nymphs invariably have been collected on the ground usually in grassy areas but when placed in cages they climb and remain near the top of the cage on any available foliage.

Adults pass the winter in hibernation under stones, boards, or around the roots of grass clumps. They begin to appear in April in Connecticut in sunny, protected places presumably at some distance from their place of hibernation.

*Distribution.*—This species ranges from the east coast of the United States to the Rocky Mountains and into the southwest. The recorded range is from Maine south to South Carolina and west to Utah, Oklahoma and Texas. Blatchley (1926), Fracker (1912), Readio (1927), Van Duzee (1917).

*Rearing Methods.*—Nymphs were reared in 16 ounce black top jars at room temperature. Each jar contained a small branch of blueberry (*Vaccinium* sp.). Blueberry was selected simply because it retains its leaves well for several days. The nymphs seem better able to catch their prey if they can hide among leaves and branches. Small flies were introduced daily into the cages. The nymphs tend to become cannibalistic if they are not well fed. *Drosophila* sp. and various other species of small flies are quite acceptable as food for both nymphs and adults. Nymphs and occasionally adults of the following families also are accepted as food: Cicadellidae, Cercopidae and Membracidae (Homoptera). Aphids and a variety of species of beetles were not accepted. Nymphs may be reared without water being supplied. However, fourth instar nymphs were observed inserting their stylets into freshly cut apple, presumably to obtain water. They also take water from wet paper toweling.

*Duration of egg and nymphal stages.*—The duration of the egg stage is 9–14 days, averaging 10 days. The insects remain as

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first instar nymphs for 8–11 days, averaging 9.6 days. The second instar time period is 8–10 days with an average of 9 days and the nymphs remain in the third instar 8–11 days, averaging 9.5 days. The nymphs remain in the fourth instar for the greatest length of time, 17–22 days, averaging 18.7 days. The total time period from egg to adult is 51–67 days with an average of 60 days. These results are based on a small number of rearings and this plus uncontrolled laboratory conditions may account for the variations in different stages.

The evidence from rearing indicates that *Fitchia aptera* has only four instars. All but one of the reared emerging adults were brachypterous forms but even the macropterous one had four instars. There have been several references in the literature to Hemiptera having only four nymphal instars. These insects are usually wingless or micropterous forms but not necessarily so. Torre-Bueno (1917) reports *Microvelia borealis* Torre-Bueno as having four nymphal instars and describes the stages. Hoffman (1925) confirms Torre-Bueno in reporting four nymphal instars for *M. borealis* and adds *M. buenoi* Drake to the list of semiaquatic Hemiptera having only four instars. In addition, Hoffman reports rearing *Nepa apiculata* Uhler and finding only four instars. Frick (1949) reported that the normal number of instars for *Microvelia capitata* Guerin in the Panama Canal Zone is 5 but that eight apterous males and one apterous female had only four nymphal stages out of a total of 110 reared from egg to adult, 76 of which were apterous.

Southwood and Fewkes (1961 describing the immature stages of the common British Nabidae report *Dolichonabis limbatis* (Dahlbom) as having only four nymphal instars and that *D. lineatus* (Dahlbom) probably has a similar life cycle. These are almost always micropterous forms. Read (1927) found only four instars in the reduviid, *Melanolestes picipes* Herrich-Schaeffer.

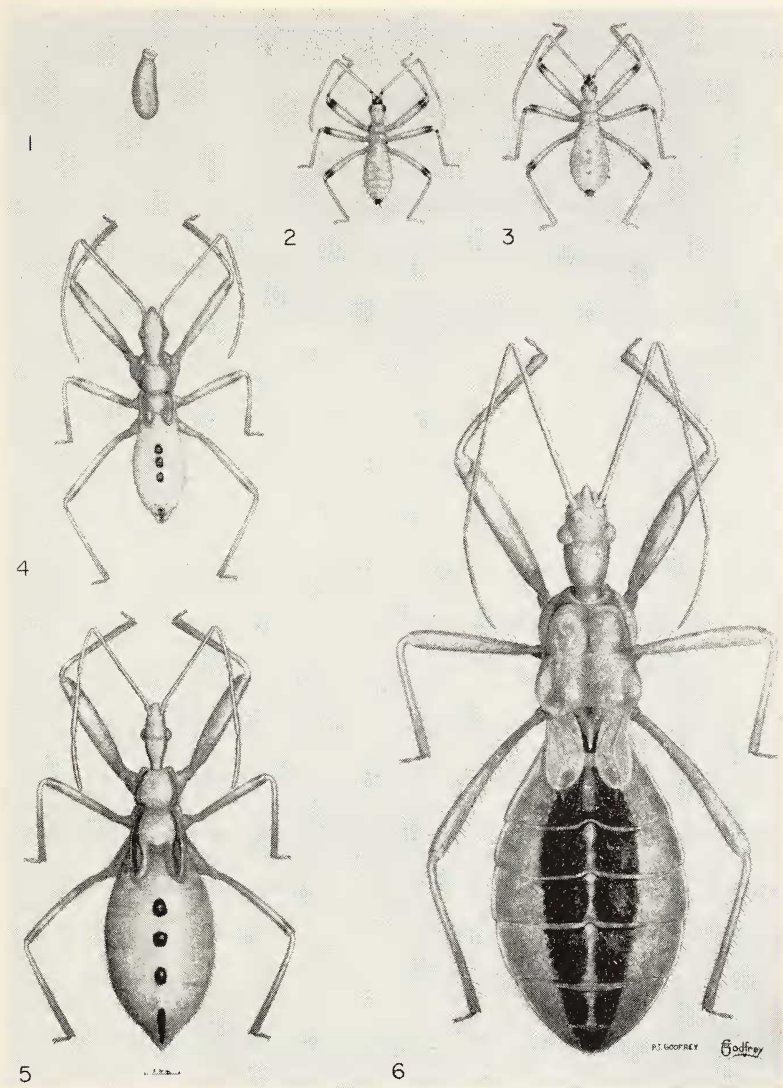
The phenomenon of reduction of instars from five to four in Heteroptera is of particular significance since it is usually associated with brachyptery or aptery. It is of interest also in that it appears to be confined to predacious forms. This may indicate a possible neotenic condition associated with wing polymorphism.

#### Description of Stages.

*The egg* (Figure 1).—The pale brown eggs are laid in clusters averaging 12 eggs per cluster. They are glued to leaves and stems of plants. The length is 2 mm, width at middle, 0.625 mm. The chorion is plain, the micropylar processes are short and flat, forming a compact cap. The red eye spot of the developing nymph

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PLATE V



Stages in the life history of *Fitchia aptera*. Fig. 1, The egg. Fig. 2 First instar. Fig. 3, Second instar. Fig. 4, Third instar. Fig. 5, Fourth instar. Fig. 6, Adult.

can be seen through the chorion as well as some indication of segmentation and the outline of appendages in the later stages of embryonic growth.

*First instar* (Figure 2).—The emerging first instar nymph is a pale cream color with lateral red stripes along the abdomen. Before feeding, it measures 2.45 mm. in length and 0.49–0.5 mm. in width across the abdomen. After feeding, it attains a length of 2.8–2.9 mm. and the width of the abdomen increases to 1.26 mm. The head anterior to the eyes is black. Length of head 0.6 mm.; width of head behind the eyes at the widest point is 0.35 mm; interocular space 0.28 mm. The rostrum is stout, curved, with three apparent segments. The short distal segment is a darker color. The antennae are as long as the body and setaceous. The segments are dark colored except the terminal ones which are red. Ratio of antennal segments 55:18:20:60.

The legs are long, pale, almost translucent and setaceous. The distal ends of the femora and the proximal ends of the tibiae are black. Forelegs raptorial but femora not greatly enlarged. The terminal portions of the tarsi are dark also. Tarsi two-segmented, the first segment very short and inconspicuous.

Thorax and abdomen pale except the two posterior segments of the abdomen which are piceous. Each of these segments bears two strong, dark colored curved spines on the dorsal aspect. Three dorsal scent gland openings are present but inconspicuous.

*Second instar* (Figure 3).—Length 3.85–4.2 mm.; maximum width of abdomen 0.9–1.26 mm.; length of head 0.9 mm.; width of head 0.42–0.49 behind eyes; interocular space 0.3–0.35 mm.; ratio of antennal segments, 59:20:22:62. The second instar nymph resembles the first instar except in size. The color is nearly the same. There is a slight change in body proportions; the head is a little longer, the thoracic segments better defined and the abdomen is a little larger. The legs and antennae more strongly setaceous. The openings of the dorsal abdominal scent glands are more evident.

*Third instar* (Figure 4).—Length 6.5 mm.; width of abdomen 1.4 mm.; length of head 1.0 mm.; width of head 0.5–0.63 mm.; interocular space 0.4 mm. ratio of antennal segments, 90:29:43:68. The head appears longer and there is a stout spine at the base of each antenna. A brown stripe extends laterally on either side along the head, over the notum and wingpads.

The prothorax is better developed in this instar and wing pads are evident, arising from the caudal margins of the meso- and metanota. The metathoracic wing pads extend posteriorly over

the first abdominal segment. Prothoracic femora somewhat enlarged. Color of legs light brown with darker areas at distal ends of femora.

Color of abdomen, light brown; lateral margins tinged with red. First abdominal spiracles dorsal in position, those of segments 2-8 ventral in position. Dorsal scent gland openings along anterior margins of segments 4, 5 and 6 are conspicuously located in shiny black areas. A median dorsal, dark colored area persists on the three posterior segments. Just anterior to this dark area are two dark colored papillae on either side of the midline, each bearing a dark colored seta.

*Fourth instar* (Figure 5).—Length 9.0 mm.; width of abdomen 2.45 mm.; length of head 2.1 mm.; width of head behind eyes 0.7 mm.; interocular space 0.53 mm. The head has become considerably longer in proportion to its width. Ratio of antennal segments, 120:35:60:78. The brown stripe which extends laterally on either side of the head, pronotum and over the wingpads is more pronounced in this instar. The borders of the wingpads are nearly black. Rostrum strong and curved.

The prothorax has developed a collar anteriorly with flattened ridges laterally along the pronotum. Wing pads arising from the caudal margins of the meso- and metanota extend posteriorly over the second abdominal segment. The legs are pale brown to brown. The dark areas at the distal ends of the femora are not as prominent as in earlier instars. The forefemora are enlarged.

The abdomen is considerably larger than in the preceding instar. The color is pale brown with the narrow scent gland openings located in three piceous areas. A median dorsal piceous stripe is located on the three posterior segments.

After approximately 18 days the fourth instar emerges as an adult (Figure 6) which is 11.5 mm. long and characterized by a wide black median dorsal stripe extending along the abdomen. The adult has ocelli, may be brachypterous or macropterous and the tarsi are 3-segmented. The pronotum is not armed with spines.

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